

Abstract

Plasma systems and methods for supplying activation energy to remove cross-linked photoresist crust using ion bombardment of the substrate from a plasma, at reduced temperature, achieved in part by operating the processing chamber at low pressures. Reduced temperatures prevent "popping" of the photoresist which can cause particulate contamination. The gas flow may comprise a principal gas, an inert diluent gas, and an additive gas. Principal gases for HDIS may comprise oxygen, hydrogen, and water vapor at pressures less than about 200 mTorr and a bias may be applied to the substrate support. When low-k dielectric material is present on vertical surfaces, reduced ion bombardment on vertical surfaces may be used, and a protective layer may be deposited on those surfaces.